

REMARKS

Claims 1-3, 5-7, 10, 12, and 14-20, of which claims 1, 2, 6, 15, and 17 are currently amended, are presently pending and appear in this application for the Examiner's review and consideration. Claims 1, 2, and 6 are amended for clarity. Claim 15 is amended to recite a diisocyanate and to correct its dependency. Claim 17 is amended to correct informality by inserting a "the" and to clarify that the floorboards are installed so that the surface features are visible. As no new matter is introduced, the entry of all amendments is warranted at this time.

Claim Rejection under 35 U.S.C. § 112

Claim 15 is rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. The Examiner states that the specification is enabled for the adhesive having diisocyanate, not isocyanate. In the interest of expediting the prosecution of this application and not as an acquiescence to the Examiner's rejection, claim 15 is amended to recite diisocyanate. Accordingly, the rejection under 35 U.S.C. § 112, first paragraph, is overcome.

Claim Rejections under 35 U.S.C. § 103

Claims 1-3, 10, and 14-20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 2,088,238 to Greenway in view of a document from Armstrong entitled "1/4" & 3/8" Engineered Products for Staple-Down & Glue-Down Installation" ("Armstrong"), U.S. Patent No. 5,951,796 to Murray, and U.S. Patent No. 5,570,554 to Searer for the reasons stated on pages 2-5 of the Office Action.

Claims 1-2 and 14-20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Greenway in view of Armstrong and Murray for the reasons stated on pages 5-8 of the Office Action.

Claims 5-7 and 12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Greenway in view of Armstrong, Murray, and Searer for the reasons stated on pages 8-10 of the Office Action.

Applicants respectfully traverse all rejections under 35 U.S.C. § 103(a), and submit that none of the cited references, alone or in combination, discloses or suggests the method for attaching solid hardwood floor planks to a concrete floor surface as recited in claim 1, the floor comprising a concrete floor surface with solid plank wood boards having a length of

at least about 3 feet adhesively attached thereto as recited in claim 5, and the method for installing on a concrete floor surface a floor comprising solid hardwood floor planks recited in claim 20. Each cited reference is discussed in detail below. A Declaration under 37 C.F.R. § 1.132 of James Perkins (the “Perkins Declaration”) submitted herewith further supports the non-obviousness of the present claims over the cited references.

1. The Claims

Independent claims 1 and 20 recite methods of attaching solid hardwood floor planks to a concrete floor surface, in which a water-resistant and water-impermeable and/or moisture-curable adhesive is applied to attach the floorboards to the concrete surface. Additionally, the boards are nailed to the concrete floor surface, and the adhesive is allowed to set. Claim 1 recites that the boards are nailed to the concrete floor surface substantially at right angles thereto, and claim 20 recites that the boards are nailed to the concrete floor surface to hold the boards to the adhesive on the concrete surface as the adhesive sets. Independent claim 5 structurally defines a floor that has a concrete surface with solid plank wood floorboards thereattached with a water resistant and impermeable adhesive, but with no subflooring between the boards and the concrete floor surface, wherein nails extend at right angles to the concrete floor surface, through the boards and the adhesive into the concrete floor surface.

As explained in the Supplemental Declaration under 37 C.F.R. § 1.132 of Richard Hirsch dated March 29, 2005 (the “Supplemental Hirsch Declaration”), prior to the invention of the claimed methods, attaching wood flooring directly to a concrete surface presented significant challenges that limited the types of preparations for the wood and compromised the quality of the installed flooring.

For example, the solid hardwood flooring needed to be very flat and straight to ensure proper and sufficient contact between the floorboards, adhesive, and the concrete. This significantly limited the type of preparation of the wood that could be used prior to floor installation, because some types of preparations cause the wood to warp, to an extent that it would not be possible to obtain a strong, complete adhesion between the concrete surface and the floorboards laid by traditional methods.

Another problem was that water can collect on the concrete surface and may not drain away from the floorboards, since floors are typically generally horizontal. Thus, when

wood floorboards are installed by traditional methods, trapped water on the concrete is absorbed into the floorboards, which can produce a highly elevated hydrostatic pressure in the floorboards. Elevated hydrostatic pressure in turn causes the floorboards to warp significantly, which is more than sufficient to cause the wood to peel away from the concrete. Hence, when using traditional installation methods, a very strong adhesive that can resist water and such warping water is needed to keep the floorboards attached to the concrete. If the adhesive cannot withstand this water and its effects on the wood floorboards, then the trapped water can destroy the adhesive bond between the wood and the concrete surface.

The claimed methods address these problems and provide surprising advantages by attaching wood floorboards with at least one water-resistant, water-impermeable and/or moisture-curable adhesive and then nailing the boards to the concrete. The combination of nails and a water-resistant, water-impermeable and/or moisture-curable adhesive allows the flooring to survive water-logging and to resist warping caused by elevated hydrostatic pressure. Further, because wood flooring installed according to the claimed methods can withstand warping, the methods do not limit the type of preparations for the wood, including preparations that cause wood to warp.

2. *Greenway*

Greenway provides wood flooring that is either laid in mastic or nailed diagonally to a wooden subfloor. Because mastic is neither water-resistant nor water-impermeable, it cannot withstand hydrostatic pressure or water-logging commonly observed in wood flooring installed directly on concrete, and would not provide strong enough adhesion to prevent warping and buckling of the flooring away from the concrete surface.

Further, Greenway specifically teaches nailing only when the flooring is being secured to a subfloor, not directly to concrete. Greenway does not disclose or suggest any need for using nails when floorboards are installed with mastic, but discloses laying in mastic and nailing as two separate and alternative methods of installation. Also, when nails are used in Greenway, they are driven “diagonally” into the nailing grooves on flooring strips (see, for example, FIG. 2 (showing nails (14) being driven into the nailing grooves at about 45-degree angle)).

Thus, Greenway teaches installing wood flooring either with an adhesive, without nails, when the flooring is attached to concrete, or with diagonally driven nails when the flooring is attached to a wooden subfloor, and does not disclose or suggest the inclusion of both a water-resistant, water-impermeable and/or moisture-curable adhesive and nailing as recited in the claims.

Applicants also note that the Examiner's statement that "Greenway (figure 2) shows nailing the boards to the concrete floor surface substantially at right angles thereto through the boards" (p. 6 of the Office Action) is incorrect. FIG. 2 of Greenway shows nails driven at a 45° angle into the subflooring. As stated in the Perkins Declaration, one of ordinary skill in the art would understand that a 45° angle is not substantially a right angle, but very far from a right angle (see Perkins Declaration ¶ 21). Greenway also clearly states that nails are driven "diagonally" downward, and provides nailing grooves at bottom corners of flooring strips, to allow such diagonal insertion of nails (see p. 2, lines 38-43; FIGS. 1, 2). Because of their placement on the flooring strips, the nailing grooves in Greenway would not readily allow nailing the strips to the underlying surface substantially at right angles thereto, since they would not allow the insertion of a hammer or a nailing gun right next to the vertical walls of the grooves.

The Examiner also incorrectly states that Greenway discloses "the step of providing the floorboards with surface wormholes (6)" (pp. 3, 6, and 8 of the office Action) is incorrect. What the Examiner classifies as "wormholes (6)" are not wormholes at all, but instead regular nailing grooves. The nailing grooves in Greenway are structured such that they would be covered from view by adjacent flooring strips upon installation (see FIGS. 1-2; p. 2, lines 38-43). A wormhole in hardwood, by contrast, is a feature that gives a certain type of appearance to the wood, and would have been understood by a person having ordinary skill in the art to be very different from nailing grooves. Unlike the nailing grooves of Greenway, a visual feature like wormholes is also not meant to be covered, since it is meant to impart a certain appearance. (See Perkins Declaration ¶ 20).

Accordingly, Greenway does not disclose or suggest nailing solid wood floorboards to a concrete surface substantially at right angles thereto as recited in claims 1 and 5, providing the floorboards with certain surface features during the preparation step as recited in

claim 2, or nailing nails into surface features such as wormholes or scratches to hide the nails therein as recited in claim 17. These claims are therefore further distinguished from Greenway.

3. *Armstrong*

Armstrong is directed to the installation of engineered flooring, and does not disclose or suggest the methods and the floor as recited in the claims. The Examiner refers to the section in Armstrong entitled “Step 3: Installation of Flooring” (p. 12) as disclosing “the step of gluing floorboard to a concrete slab and then nailing the floorboard to the substrate . . . to help hold the row in place” (Office Action at pages 3, 6, and 9). The Examiner, however, misinterprets Armstrong.

Armstrong explicitly specifies that concrete slabs should be used for glue-down installation only, and not for staple-down installation. In the section entitled “Subfloor Requirements,” Armstrong separately lists subfloor types suitable for “staple-down or glue-down” installation and those suitable for “glue-down only” (see p. 5). “Concrete slabs” is listed as a subfloor recommended for “glue-down only.” Further, Armstrong specifically instructs to use a plywood subfloor for staple-down installation on concrete slabs (see p. 6 (“Install a suitable moisture barrier followed by a plywood subfloor with a minimum thickness of 1/2”“)). Thus, Armstrong teaches using only an adhesive to install flooring directly on concrete, and requires a plywood subfloor between the flooring and the concrete for installation with nails. Armstrong does not disclose or suggest installing the flooring directly on concrete with an adhesive and nails as recited in the claims of this application. (See Perkins Declaration ¶ 6).

The section in Armstrong cited by the Examiner also does not disclose “the step of gluing floorboard to a concrete slab and then nailing the floorboard to the substrate” as the Examiner states. That section provides instructions for glue-down installation generally. It discloses how to lay engineered floorboards after spreading an adhesive on a subfloor, and provides that, “[i]f necessary, nail a sacrificial row with 1” nails on the dry side of your chalk line to help hold the first row in place” (p. 12). Since the sacrificial row is placed on the dry side of the chalk line, there is no adhesive applied to the underside of the sacrificial row. (See Perkins Declaration ¶ 7).

In fact, as explained in the Perkins Declaration, a person having ordinary skill in the art knows that an adhesive is never applied to the underside of a sacrificial row. Because a

sacrificial row is intended to be only a place holder, to maintain a straight line to which to install the rest of planks, and be removed after installation of flooring, an adhesive is not applied on a sacrificial row to facilitate its removal. (See Perkins Declaration ¶ 8).

Thus, Armstrong does not disclose or suggest the methods for attaching or installing solid hardwood floor planks as recited in claims 1 and 20 and the floor as recited in claim 5. Furthermore, Armstrong does not disclose or suggest nailing floorboards to concrete substantially at right angles thereto as recited in claim 1. To the contrary, Armstrong specifically discloses nailing at a 45° angle (see FIG. 3 on p. 4 (showing staples installed at 45° at various air pressures); p. 7 (instructing to pre-drill and blind-nail at a 45° angle through the tongue of the row)). (See Perkins Declaration ¶ 9). Hence, claim 1 is further distinguished from Armstrong for this additional reason.

In addition, Armstrong is directed to installation of engineered flooring, which has a very different construction and behavior from solid hardwood flooring. (See Perkins Declaration ¶ 10).

Solid hardwood has its grain running in one direction and therefore exhibits curving, bowing, and twisting in response to factors such as humidity and moisture as well as wood processing steps prior to installation. Thus, to use any adhesive to attach solid wood flooring directly to concrete, the flooring needed to be very flat and straight to ensure proper and sufficient contact between the flooring, adhesive, and concrete. Also, because solid wood tends to curve longitudinally as well as laterally, a solid wood floorboard must be pushed or pulled tightly to an adjacent board and then quickly nailed in place to be held down and straight. This significantly limited installation conditions for solid hardwood flooring, as well as wood preparations that could be conducted prior to installation. The claimed methods for installing solid hardwood floor planks solve these problems by using both a water-resistant and water-impermeable and/or water-curable adhesive and nailing. Providing nails in addition to a water-resistant and water-impermeable and/or water-curable adhesive can keep the wood floorboards in proper contact with the adhesive, and the adhesive in proper contact with the concrete surface while the adhesive cures, thus greatly improving resistance to longitudinal and lateral warping and movement of the wood, and holding the boards straight to avoid curving that would cause gaps in the floor. (See Perkins Declaration ¶ 11).

Unlike solid wood flooring, engineered flooring is designed with a series of plies of wood laid with the grain running in a criss-cross pattern. The resulting engineered floorboard is very straight and flat, without curving, bowing, or twisting. Indeed, engineered flooring was invented in part to overcome limitations of solid wood flooring caused by warping, and to allow effective direct installation over concrete. Engineered flooring is thus more stable to factors such as humidity, is not warped due to any processing steps, and does not need to be held flat against the subfloor during installation. Consequently, there is simply no need to hold down adhesively attached engineered flooring by additional nailing to “hold it in place” until the adhesive dries. (See Perkins Declaration ¶ 12).

The differences between solid wood flooring and engineered flooring are further demonstrated by Armstrong’s own sets of instructions archived at http://web.archive.org/web/20010418225515/www.armstrong.com/resbrucewoodna/installation_tips.jsp. In addition to the Armstrong reference cited by the Examiner, Armstrong provides separate installation instructions for 3/4” solid plank and strip products for nail-down installation; 1/4” and 5/16” solid oak parquet products for glue-down installation; 5/16” Natural Reflections solid strip for staple-down and glue-down installation; and Coastal Woodlands 3/8” & 1/2” floating floors for floating or glue-down installation. None of these instructions discloses nailing solid hardwood directly to concrete; all require a suitable nailing substrate such as plywood for solid hardwood installation. As an example, the instructions for 3/4” solid plank and strip products, entitled “3/4” Solid Plank & Strip Products for Nail-Down Installation” (the “Solid Plank Instructions”) (at http://web.archive.org/web/20010418225515/www.armstrong.com/resbrucewoodna/installation_tips.jsp), published around the same time as the cited Armstrong reference, is submitted herewith as Exhibit A to the Perkins Declaration. (See Perkins Declaration ¶¶ 13-14).

The Solid Plank Instructions discloses recommended subfloor surfaces for installing solid wood plank or strip as plywood, existing solid wood flooring, screeds, and T&G wood subflooring (see p. 3), with plywood being preferred. Concrete is not included in the recommended subfloor surfaces. The Solid Plank Instructions provides that “appropriate nailing surface” is required to install solid flooring over concrete (see p. 4). A plywood subfloor is disclosed as a subfloor for installing solid flooring on concrete slabs. Thus, the Solid Plank Instructions shows that, at the time of its publication, installing solid wood on concrete was

known to require an appropriate nailing surface, such as a plywood subfloor, between the wood flooring and the concrete. The Solid Plank Instructions further teaches blind-nailing plank boards at a 45° angle (see p. 5). Thus, the Solid Plank Instructions shows the state of the art at the time of its publication that installation of solid wood on concrete required a subfloor and nailing at 45°. (See Perkins Declaration ¶¶ 15-16).

Therefore, Armstrong, which provides no disclosure or suggestion to one of ordinary skill in the art of using both an adhesive and nails to install solid hardwood flooring, and which is directed to a completely different flooring material, would not have rendered the claims obvious.

4. *Murray*

Murray discloses a two-component polyurethane adhesive used to bond a construction material to a construction substrate. The adhesive is formed by mixing a polyisocyanate prepolymer and a blend of elastomeric and flexible polyglycols immediately prior to applying or dispensing the adhesive on a substrate. The adhesive has specific reactive and foaming properties. It is a frothing foam that expands upon application to the substrate surface to fill voids or imperfections and collapses when the material to be bonded is placed in contact with the adhesive. The adhesive is applied in a specific manner, by mixing the two components under low pressure; dispensing the adhesive foam onto the surface of a construction substrate; allowing the adhesive foam to expand over the surface of the construction substrate and to initiate cell rupture; placing the construction material to be bonded in contact with the adhesive foam on the surface of the construction substrate; and allowing the adhesive foam to partially collapse and cure, forming a void-filling membrane that bonds the construction material to the construction substrate (see col. 5, lines 49-63).

Murray generally defines the term “construction materials” as materials used in the construction of residential and commercial dwellings, including ceramic tiles, wood parkay flooring, drywall or exterior sheathing, decorative wall boards, wood subfloor, and concrete decks (see col. 3, lines 17-14). The term “construction substrates” is also generally defined as various structural and foundational surfaces encountered in the construction of residential and commercial dwellings, including wood subfloors, concrete subfloors, wood, and concrete blocks (col. 3, lines 25-30). Murray, however, provides no actual disclosure of using the disclosed

adhesive for floor installation. Rather, the examples disclosed in Murray are directed to adhesion of tiles, asphalt shingles, decorative bricks, roof insulation board, roof membrane, and cement blocks.

Moreover, Murray does not disclose or suggest installing any construction material to a construction substrate by using both the adhesive and nailing. In particular, Murray does not disclose or suggest attaching or installing solid hardwood floor planks to a concrete floor surface by applying an adhesive and nailing as recited in claims 1 and 20, or the floor comprising a concrete floor surface with solid plank wood floor boards as recited in claim 5. Accordingly, Murray does not render the present claims obvious.

5. *Searer*

Searer is directed to avoiding adhesives altogether in floor installation by providing interlocking floor that is secured only with a staple or nail. The complete absence of any adhesive is an essential feature of the Searer flooring, which is specifically intended to avoid aeration and such other treatments required when using an adhesive as well as problems caused by chemical adhesives that can contain toxic or harmful chemical substances. Searer achieves such complete avoidance of adhesive by providing floor members of interlocking design, and by projecting a staple or nail substantially vertically into a blind surface on the flooring member and into the holding surface. Thus, Searer does not disclose or suggest, but actually teaches away, from the claimed methods and floor, which include an adhesive.

6. *The Claims Are Not Obvious Over Any Combination of the Cited Art*

As explained above, none of the cited references discloses or suggests attaching or installing solid hardwood floor planks to a concrete floor surface by using both an adhesive and nailing as recited in claim 1 and 20 and the floor as recited in claim 5. The cited references, in any combination, also do not disclose or suggest the claimed methods and floor. Further, because each cited reference is directed to a different flooring method that achieves a different effect or purpose, a person having ordinary skill in the art would not have had a motivation to combine the references to achieve the flooring methods and the floor recited in the present claims. (See Perkins Declaration ¶¶ 18-19).

In particular, Greenway's use of mastic and Murray's use of reactive polyurethane adhesive are incompatible with Searer's complete avoidance of adhesive and cannot be properly combined. Greenway's diagonal nailing into a wooden subfloor is also incompatible with Searer's substantially vertical nailing. Indeed, a person of ordinary skill in the art would find the use of an adhesive in attaching floorboards to be contrary and repulsive to the teachings of Searer, such that Greenway and Murray's teaching of using mastic and reactive polyurethane adhesive cannot be reconciled with Searer's teaching of not using any adhesive. As the MPEP provides, "[i]t is improper to combine references where the references teach away from their combination" (MPEP § 2145(X)(D)(2)). Further, one cannot pick and choose isolated bits and pieces of prior art to arrive at a claimed combination in hindsight, but the "totality of the prior art must be considered, and proceeding contrary to accepted wisdom in the art is evidence of non-obviousness." (MPEP § 2146(X)(D)(3)). Thus, the nails of Searer cannot be selected on its own, apart from the totality of the Searer teaching, and combined with Greenway and/or Murray, since Searer, considered in its entirety, is directed to avoiding the use of adhesives. Searer is therefore not properly combinable with either Greenway or Murray, and there is also no motivation to make such combination.

Armstrong is further different from the other references as being directed to a different type of material, i.e., engineered flooring instead of solid wood flooring, that have different properties. Because the engineered flooring of Armstrong behaves differently from, and can be treated and installed in a way different from, solid wood flooring, a person having ordinary skill in the art would not be motivated to combine Armstrong with the other references cited in the Office Action.

Moreover, because no combination of the cited references provides cumulative teaching of using both a water-resistant and water-impermeable and/or moisture-curable adhesive and nails to attach solid hardwood floor planks to a concrete floor surface, the references, either taken alone or in combination, do not render the claims obvious. Further, the advantages provided by the claimed methods and floor are surprising in light of any possible combination of the references. Specifically, providing nails in addition to the adhesives can keep the floorboards in proper contact with the adhesive, and the adhesive in proper contact with the concrete surface while the adhesive cures, thereby greatly improving resistance to warping and movement of the wood that can be encountered during installation.

7. *Secondary Considerations*

Applicants hereby incorporate by reference the statements regarding secondary considerations of non-obviousness of the claims submitted in the Amendment dated April 20, 2005. As noted therein, the U.S. Supreme Court has established that secondary considerations of non-obviousness must be considered during the examination of claims, and the U.S. Patent and Trademark Office, in following the U.S. Supreme Court decisions, requires factual inquiries into the background for determining obviousness, which includes evaluating evidence of secondary considerations. The evidence of outstanding commercial success and surprising benefits of the product constructed according to the claims was presented in the Declaration under 37 C.F.R. § 1.132 of Richard Hirsch dated July 6, 2004 and in the Supplemental Hirsch Declaration, and was further explained in the April 20, 2005 Amendment. All such evidence of secondary considerations of non-obviousness must be considered.


Accordingly, all rejections under 35 U.S.C. § 103(a) should be withdrawn.

Additionally, claim 2 recites that the preparing step comprises providing the floorboards with surface wormholes or scratches, colors and finishes, or a combination thereof. Thus, the method recited in claim 2 not only provides surface wormholes or scratches, colors and finishes, or a combination thereof, but provides such features to prepare the floorboards. None of the cited references disclose or suggest providing such surface features during preparation of floorboards before attaching the floorboards to the concrete. Further, such surface feature provides the surprising advantage that newly installed floorboards can have certain desired appearance, such as looking aged. Claim 17 recites that the floorboards are prepared with surface features that include at least one of wormholes and scratches, and that the floorboards are nailed by nailing nails into the surface features to hide the nails therein. Such feature is also not disclosed or suggested in the cited references, and provides the surprising advantage that newly installed floorboards can have certain desired appearance, such as looking aged and/or appearing to have been installed without nails, since nails are hidden in surface features. Thus, these claims are further patentably distinguished from the cited references.

In view of the above, the entire application is now believed to be in condition for allowance. Should any issues remain, a personal or telephone interview is respectfully requested to expedite the allowance of the application.

Respectfully submitted,

Aug. 2, 2007
Date


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